

5 An apparatus and method for improving servo loop performance in a disc drive storage system are provided. The servo loop includes a voice coil motor actuator that moves the head in response to a received servo control signal. A sensor, located in the head, senses servo information located on the disc and produces a servo signal therefrom. The servo signal is combined with a reference  
10 signal to produce a position error signal. A servo controller receives the position error signal and responsively produces the servo control signal. The servo controller includes a drive signal generator that receives the position error signal and responsively produces a driving energy signal. A vibration damping circuit receives the driving energy signal and responsively produces the servo control  
15 signal. A real-time adaptive loop shaping circuit, included in the servo loop, detects vibrations in the position error signal and responsively adjusts at least one parameter of a transfer function of the vibration damping circuit to reduce vibrations at different frequencies in the driving energy signal.